SERVICE MANUAL

10A QFM™ Forward Bin Dumper

Manual Number 6835513

cascade® corporation

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1.1 Introduction

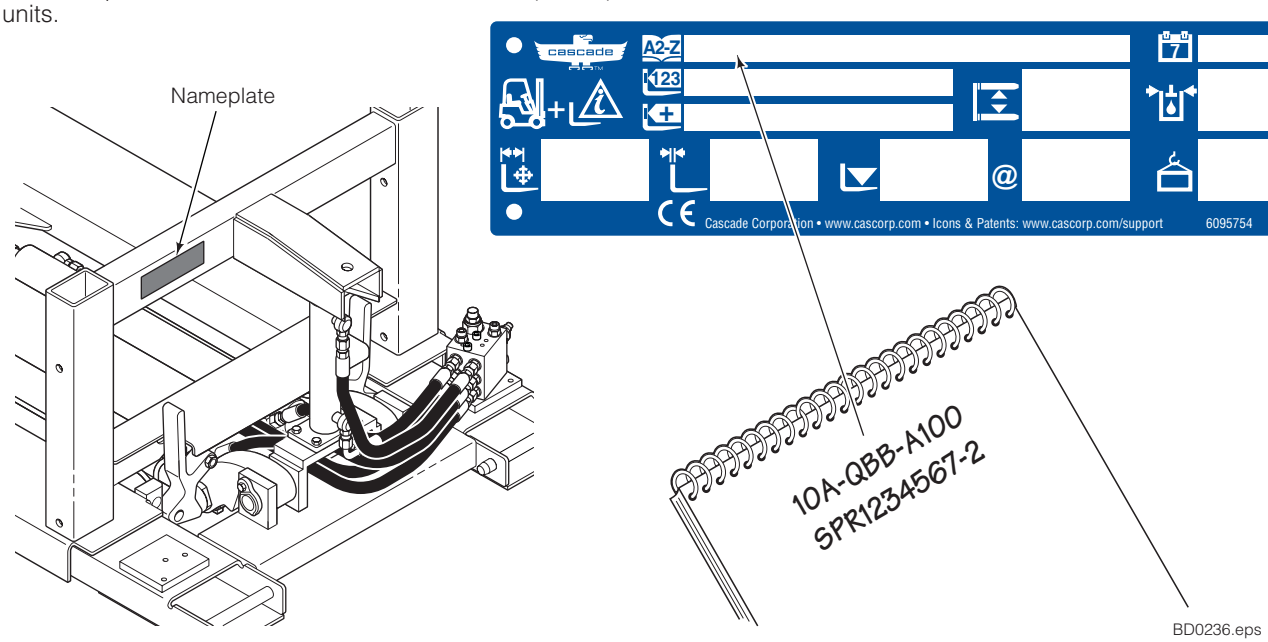
This manual provides the Periodic Maintenance, Troubleshooting, Service and Specifications for Cascade 10A QFM™ Forward Bin Dumpers.

The attachment is designed to handle agricultural and industrial bins of various sizes and capacities.

In any communication about the attachment, refer to the product catalog and serial numbers stamped on the nameplate. If the nameplate is missing, the numbers can be found stamped on the left upper structure.

IMPORTANT: All hoses, tubes and fittings on these attachments are SAE O-Ring Face Seal.

NOTE: Specifications are shown in both US and (Metric) units.



1.2 Special Definitions

The statements shown appear throughout this Manual where special emphasis is required. Read all WARNINGS and CAUTIONS before proceeding with any work. Statements labeled IMPORTANT and NOTE are provided as additional information of special significance or to make your job easier.

WARNING - A statement preceded by WARNING is information that should be acted upon to prevent **bodily injury.** A **WARNING** is always inside a ruled box.

CAUTION - A statement preceded by CAUTION is information that should be acted upon to prevent machine damage.

IMPORTANT - A statement preceded by IMPORTANT is information that possesses special significance.

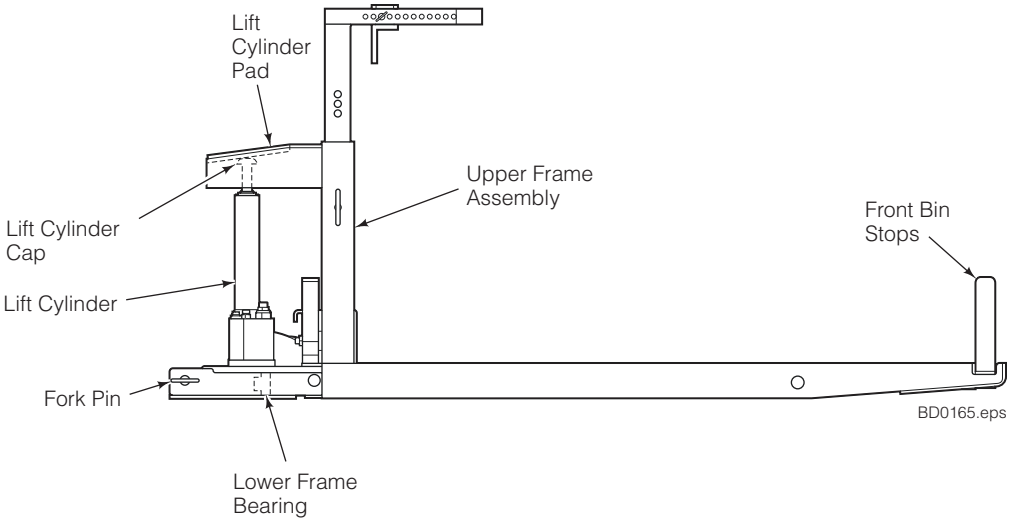
NOTE - A statement preceded by NOTE is information that is handy to know and may make your job easier.

2.1 100-Hour Maintenance

Every time the lift truck is service or every 100 hours of truck operation, whichever comes first, complete the following maintenance on the attachment:

- Check for loose or missing fasteners, worn or damaged hoses and hydraulic leaks.
- Inspect front bin stops for damage. If front stops do not go all the way down, loosen the domed nut jam nuts. Turn the outer nut CW 1/4 turn. Tighten nuts and test.
- Check that the fork pin detent locks when engaged.

WARNING: After completing any service procedure, always test each function through five complete cycles. First test with no load, then test with a load to make sure the attachment operates correctly before returning it to the job.

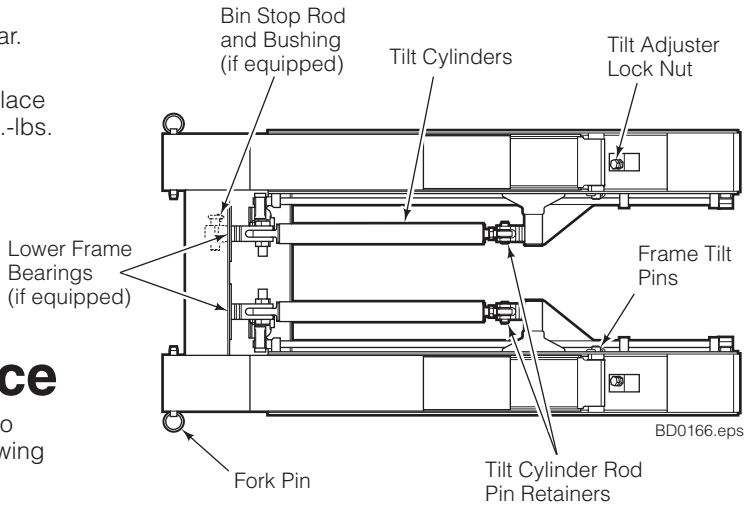


Side View

2.2 500-Hour Maintenance

After each 500 hours of truck operation, in addition to the 100-hour maintenance, perform the following procedures.

- Inspect tilt cylinder rod pin retainers. If necessary, tighten capscrews to 9.5 ft.-lbs. (13 Nm).
- Inspect the front bin stop rod and bushings for wear. Replace as necessary.
- Inspect frame tilt pins and bushings for wear. Replace as necessary. Tighten retainer capscrews to 9.5 ft.-lbs. (13 Nm).
- Verify that the tilt frame rotates to 135° position. If necessary adjust locknut located underneath the attachment.



Bottom View

2.3 1000-Hour Maintenance

After each 1000 hours of truck operation, in addition to the 100 and 500-hour maintenance, perform the following procedures.

- Inspect lower frame and lift cylinder bearings for wear. Replace as necessary. If the bearing is worn to less than 3/32 in. (2.5 mm) thickness, replace the bearing set. Refer to service section 4.3-1 for replacement procedure.
- Inspect lift cylinder cap for wear. Replace as necessary.

2.4 2000-Hour Maintenance

After 2000 hours of truck operation, in addition to the 100, 500 and 1000-hour maintenance, forks in use shall be inspected at intervals of not more than 12 months (for single shift operations) or whenever any defect or permanent deformation is detected. Severe applications will require more frequent inspection.

Fork inspection shall be carried out by trained personnel to detect any damage that might impair safe use. Any fork that is defective shall be removed from service. Reference ANSI B56.1-2005.

Inspect for the following defects:

- Surface cracks
- Straightness of blade and shank
- Fork angle
- Difference in height of fork tips
- Positioning lock
- Wear on fork blade and shank
- Wear on fork hooks
- Legibility of marking

NOTE: Fork Safety Kit 3014162 contains wear calipers, inspection sheets and safety poster. Also available is fork hook & carriage wear gauge 209560 (Class II), 209561 (Class III) and 6104118 (Class IV).

3.1 General Procedures

3.1-1 Truck System Requirements

- Truck hydraulic pressure should be within the range shown in Specifications, Section 5.1. **PRESSURE TO THE ATTACHMENT MUST NOT EXCEED 2300 psi (160 bar).**
- Truck hydraulic flow should be with the volume range shown in Specifications, Section 5.1.
- Hydraulic fluid supplied to the attachment must meet the requirements shown in Specifications, Section 5.1.

WARNING: Before servicing any hydraulic component, relieve pressure in the system. Turn the truck off and move the truck auxiliary control valves several times in both directions.

After completing any service procedure, test the attachment through several cycles. First test the attachment empty to bleed any air trapped in the system to the truck tank. Then test the attachment with a load to be sure it operates correctly before returning to the job.

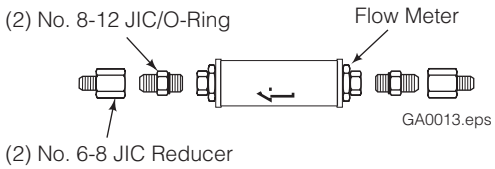
Stay clear of the load while testing. Do not raise the load more than 4 in. (10 cm) off the floor while testing.

3.1-2 Tools Required

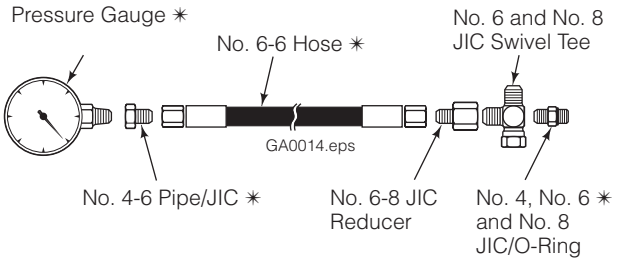
In addition to a normal selection of hand tools, the following are required:

- 20 GPM (80 L/min) Flow Meter Kit: Cascade Part No. 671477
- 3000 psi (200 bar) Pressure Gauge Kit: Cascade Part No. 671212
- Quick-disconnect adapters and fittings.

Flow Meter Kit 671477



Pressure Gauge Kit 671212



3.1-3 Troubleshooting Chart

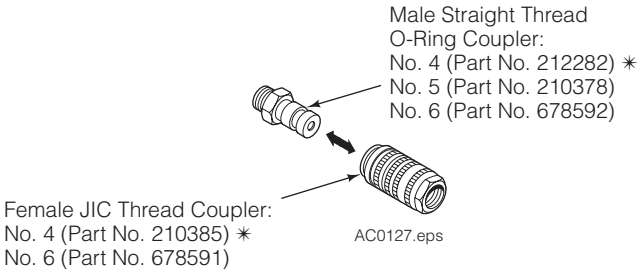
Determine All The Facts – It is important that all the facts regarding the problem are gathered before beginning service procedures. The first step is to talk to the equipment operator. Ask for a complete description of the malfunction. The following guidelines can then be used as a starting point to begin troubleshooting procedures:

Tilt Circuit

- Bin Retainers do not close or hold bin properly.
- Attachment tilts or retracts slowly or not at all.
- Attachment will not lift bin.
- Attachment lifts bin slowly.
- Lift cylinder drifts, pushing or raising upper frame upward over time, while attachment is not in use. Front bin stops may also drift open.

To correct one of these problems, see Section 3.3.

Diagnostic Quick-Disconnect


Male Straight Thread O-Ring Coupler:
No. 4 (Part No. 212282) ✳
No. 5 (Part No. 210378)
No. 6 (Part No. 678592)
Female JIC Thread Coupler:
No. 4 (Part No. 210385) ✳
No. 6 (Part No. 678591)
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✳ **NOTE:** Diagnostics Kit 394382 includes items marked.

3.2 Plumbing

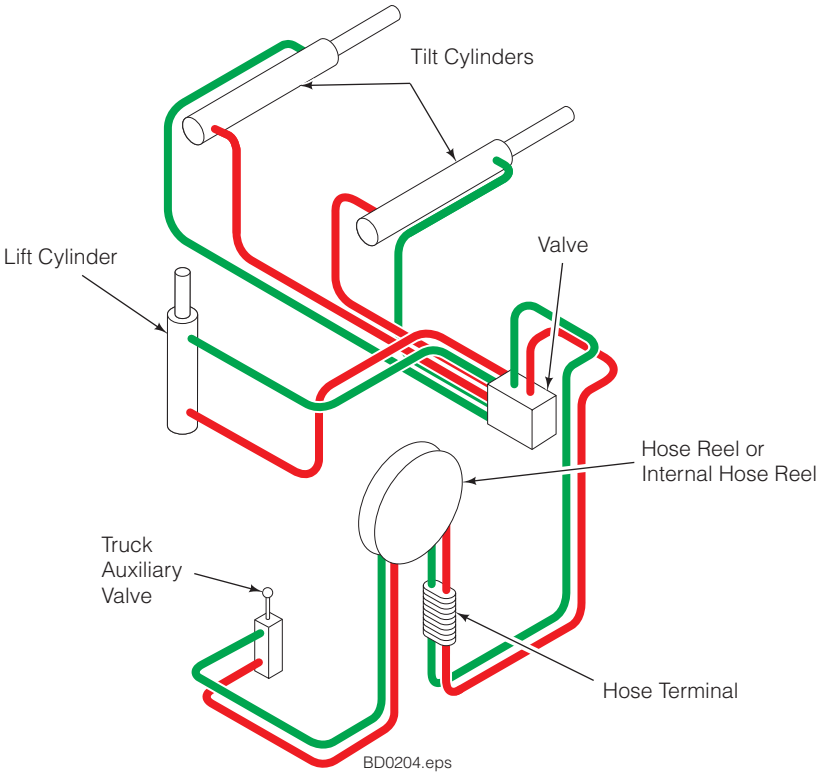
3.2-1 Hosing Diagram

TILT FORWARD

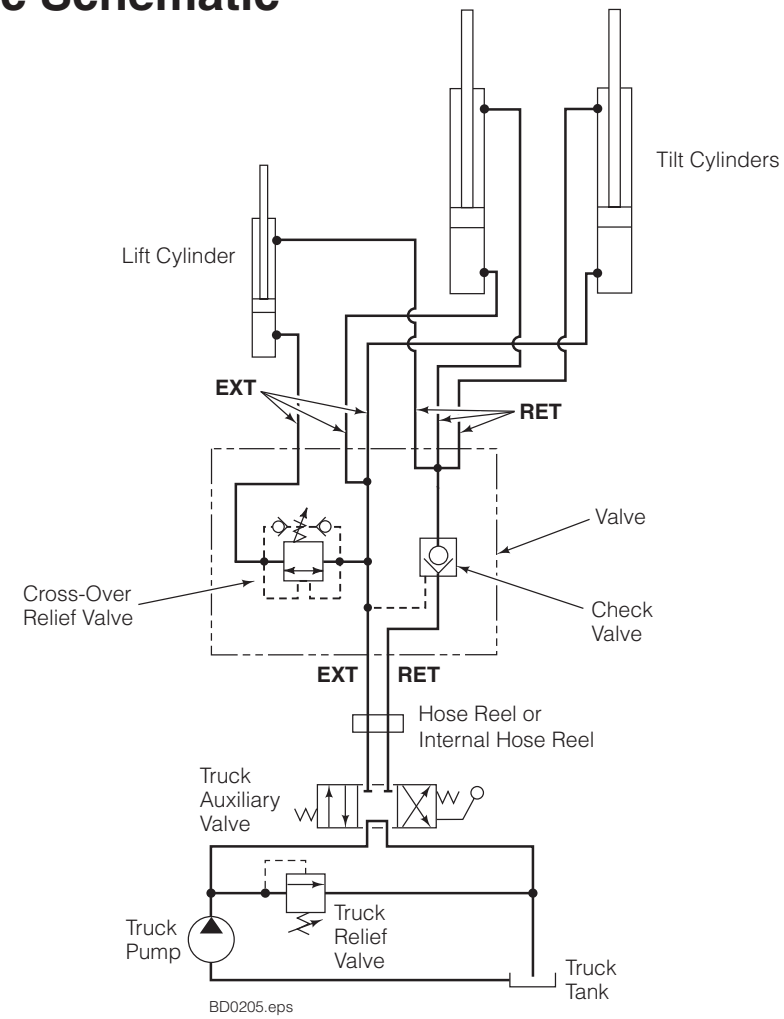
PRESSURE

RETURN

NOTE: For **TILT BACK**, reverse the colors shown.



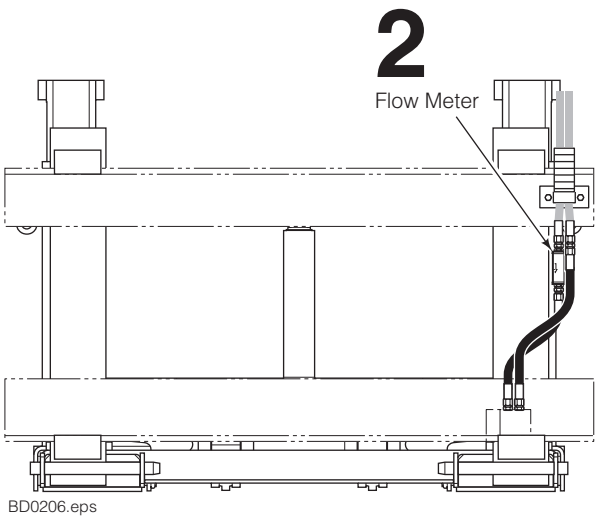
3.2-2 Hydraulic Schematic



3.3 Tilt Function

There are six potential problems that could affect the tilt function:

- Incorrect bin size or load handling. For suggested procedures, Refer to operator's section in *User Manual 6801202*.
- Damaged front bin retainer or pushrod.
- Incorrect hydraulic pressure or flow from lift truck.
- External leaks.
- Defective valve cartridges or cylinder seals.
- Cylinder fittings or flow restrictors plugged, incorrect fitting type, or not installed correctly.



3.3-1 Tilt Circuit Test

1 Check the pressure supplied by the truck at the carriage hose terminal. Pressure must be within the range shown in Specifications, Section 5.1. **PRESSURE TO THE ATTACHMENT MUST NOT EXCEED 2300 psi (160 bar).**

2 Check the flow volume at the carriage hose terminal. Flow must be within the range shown in Specifications, Section 5.1

3 Tilt the attachment FORWARD until tilt cylinders are bottomed out. Turn the truck off and relieve attachment system pressure.

4 On the left tilt cylinder, disconnect the hose that runs to the rod end of the cylinder at the bulk head fitting. Cap bulk head fitting. Do not disconnect the rod end fitting. Place disconnected hose into the bucket.

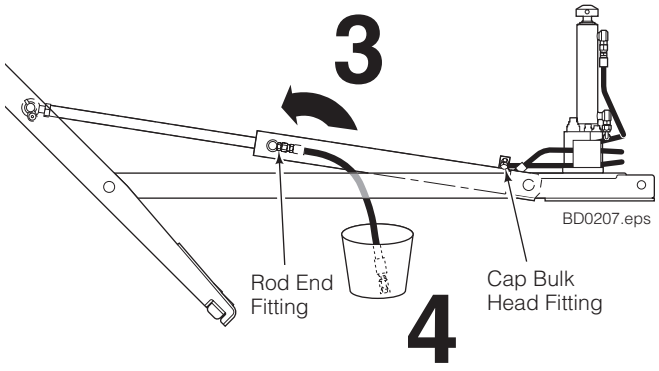
5 Turn truck on and continue to extend the attachment FORWARD. Check if oil flows into the bucket. If so, service cylinder seals. Refer to Section 4.5.

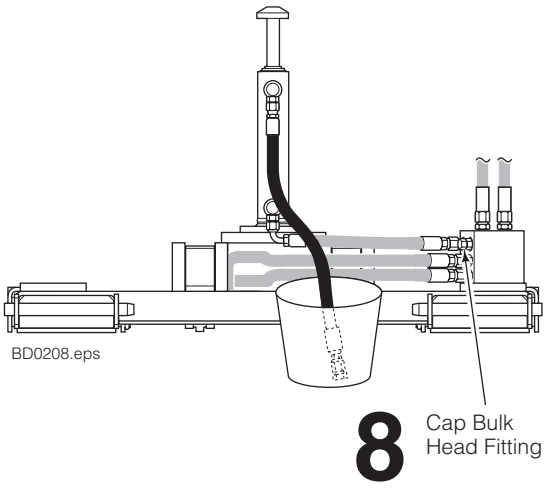
6 Turn truck off and reconnect hose to bulk head fitting.

7 Repeat steps 4-6 for right tilt cylinder.

8 Turn the truck off and relieve the truck system pressure. Disconnect the lift cylinder hose at the valve. Cap valve fitting. Place disconnected hose end into the bucket.

9 Turn truck on and continue to extend the attachment FORWARD. Check if oil flows into the bucket. If so, service cylinder seals. Refer to Section 4.6.





For Drift Occurrences:
If the cylinders are fully retracted and over time the lift cylinder has lifted and the front bin stops have begun to open, the lift cylinder will need to be serviced. Replace piston seals.

4.1 Attachment Removal

1 Retract the attachment fully.

> **WARNING**: Before removing any hoses, relieve pressure in the hydraulic system. With the truck off, open the truck auxiliary control valve(s) several times in both directions.

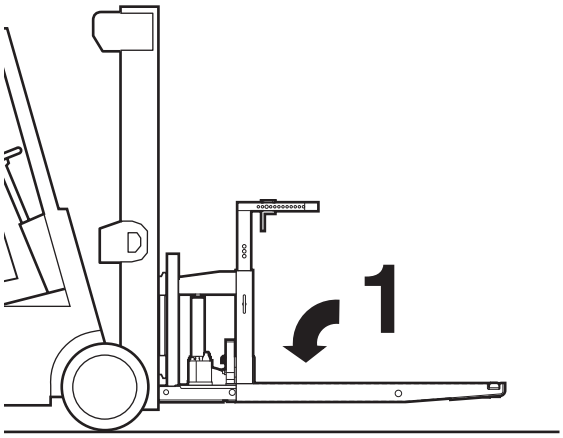
2 Disconnect, plug and tag the hydraulic supply hoses at the attachment fittings.

3 Lower the attachment onto the pallet.

4 Remove fork pins behind fork heel. Drive truck backward to remove forks from attachment.

5 For installation, reverse the above procedures with the following exceptions.

- Refer to the User Manual 6801202 for complete installation procedure.



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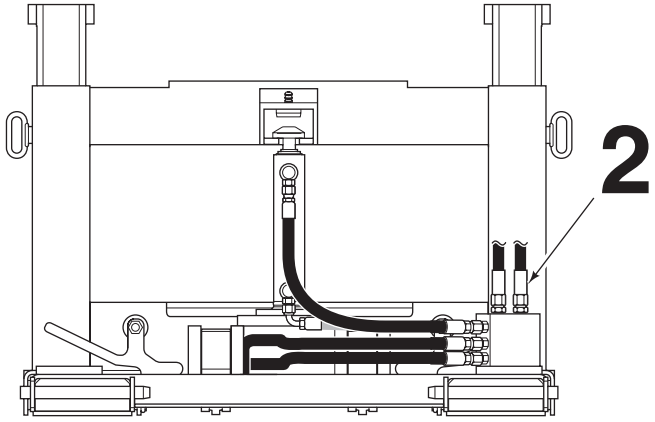

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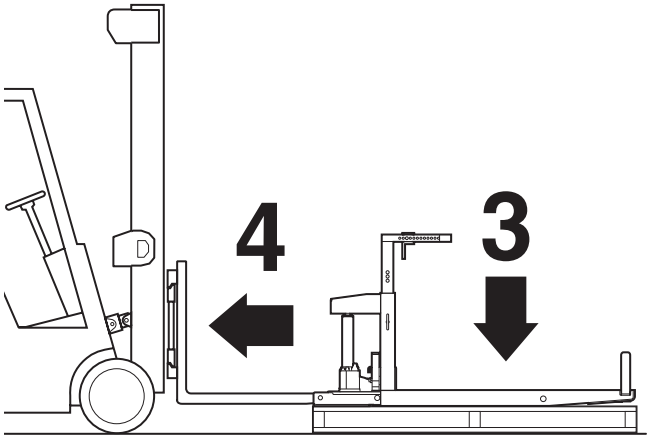

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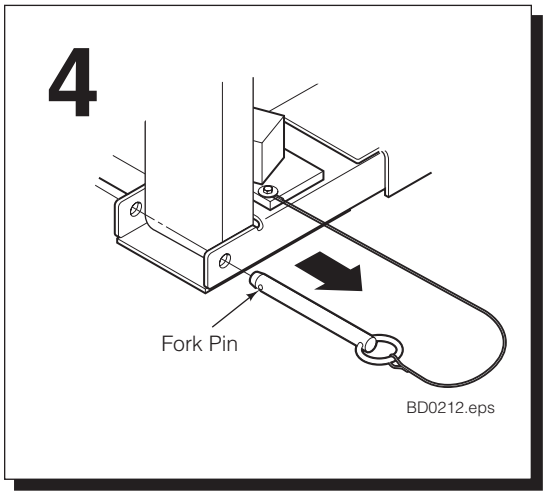

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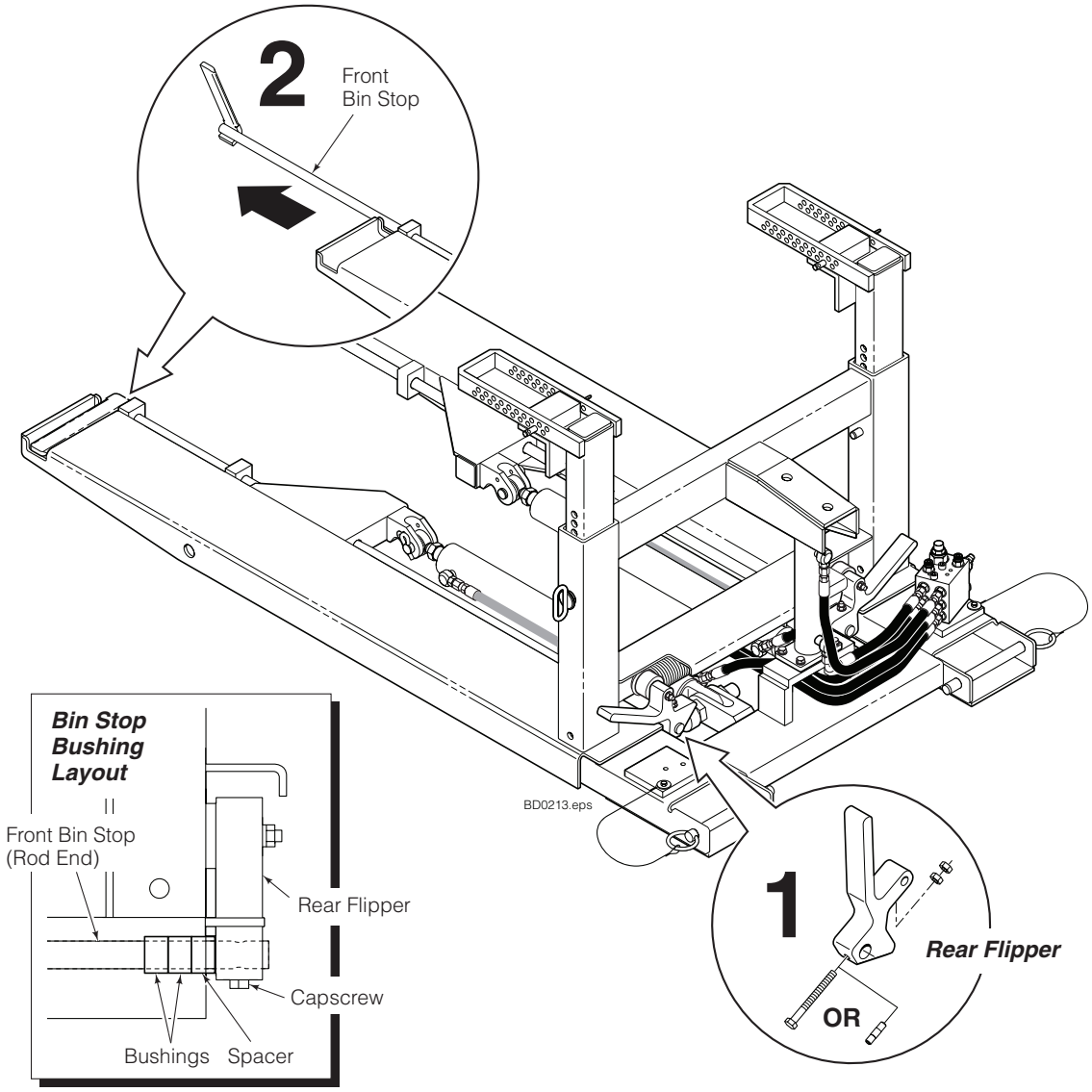
4.2 Upper Frame

Service to the upper frame components can be performed while the attachment is mounted on the truck.

4.2-1 Front Bin Stop Service

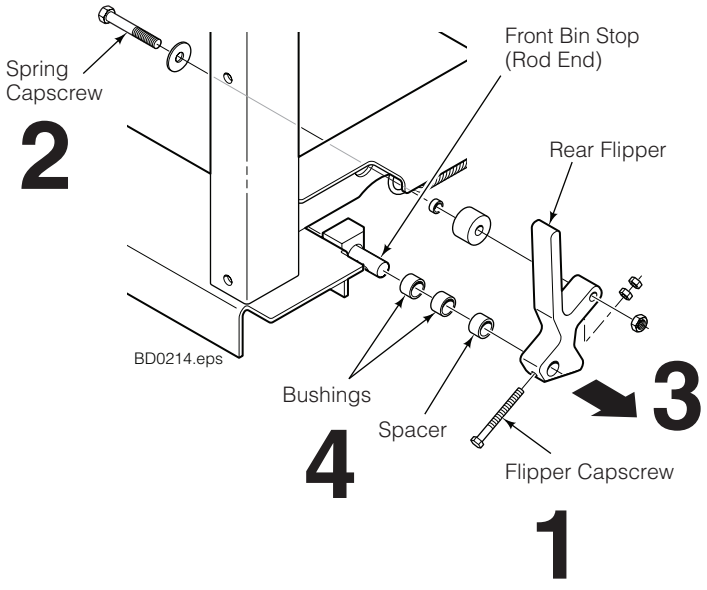
1. With the attachment fully retracted, remove the capscrew (early models: drive pin) connecting the front bin stop rod end to the rear flipper.
2. Pull (or tap as needed) the front bin stop from the front the attachment. Note the spacers and bushing placement.
3. Replace or repair front bin stop, as needed.
4. For reassembly, install the bin stop through the front of the attachment. Note the placement of the bushings and the spacer, as shown. Install capscrew (or drive pin) into rear flipper. Tighten capscrew to 15 ft.-lbs. (20 Nm).



4.2-2 Rear Flipper Bushing Service

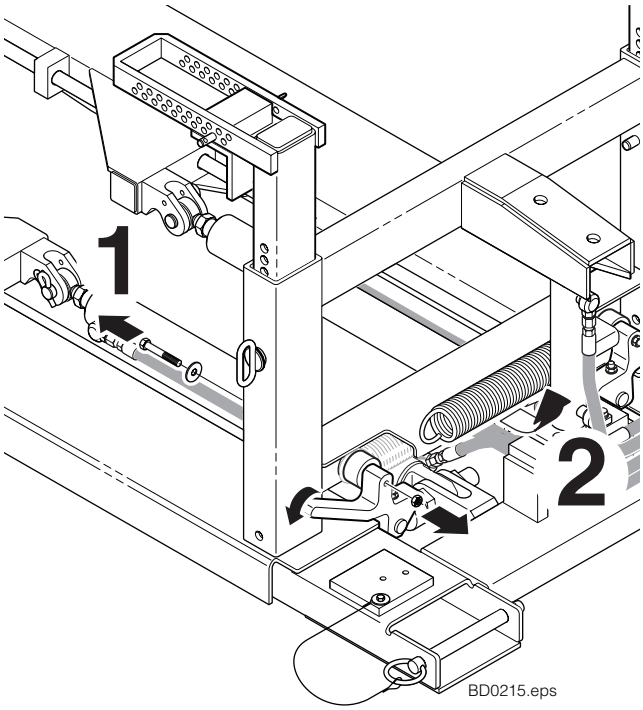
NOTE: Service to the rear flipper bushing can be performed while servicing the front bin stop.

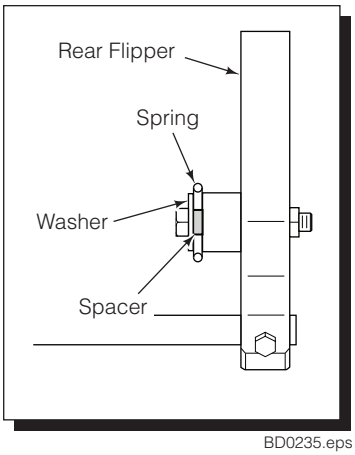
1. Remove capscrew (or drive pin) that connects the rear flipper to the front bin stop (rod end). For reassembly, tighten capscrew to 15 ft.-lbs. (20 Nm).
2. Remove capscrew that connects the rear flipper to the spring. Access the capscrew though the front of the upper frame. For reassembly, tighten capscrew to 15 ft.-lbs. (20 Nm).
3. Remove rear flipper.
4. Pull (or tap as needed) the front bin stop through the front until the bushings and spacer can be removed from the rod end.
5. Replace bushings as necessary.
6. For reassembly, reverse the above procedures.



4.2-3 Rear Flipper Spring Replacement

1. Remove each capscrew that connects the rear flippers to the spring. Access the capscrew though the front of the upper frame. For reassembly, tighten capscrew to 15 ft.-lbs. (20 Nm).
2. Remove the spacers and spring.
3. Replace the spring.
4. For reassembly reverse the above procedures.





4.2-4 Tilt Pin & Bushing Service

Pin-Only Replacement:
Remove the capscrew and eye pin. Do one side at a time:

- Use a spare pin to drive old pin out of frame.
- Install new pin, displacing spare pin. Tighten eye pin capscrew to 15 ft.-lbs. (20 Nm).

Pin and Bushing Replacement:

1 Tilt the upper frame forward to a 90° position.

2 Attach a safety chain to the upper frame, as shown.

3 Remove the capscrew and eye pin. For reassembly, tighten capscrew to 15 ft.-lbs. (20 Nm).

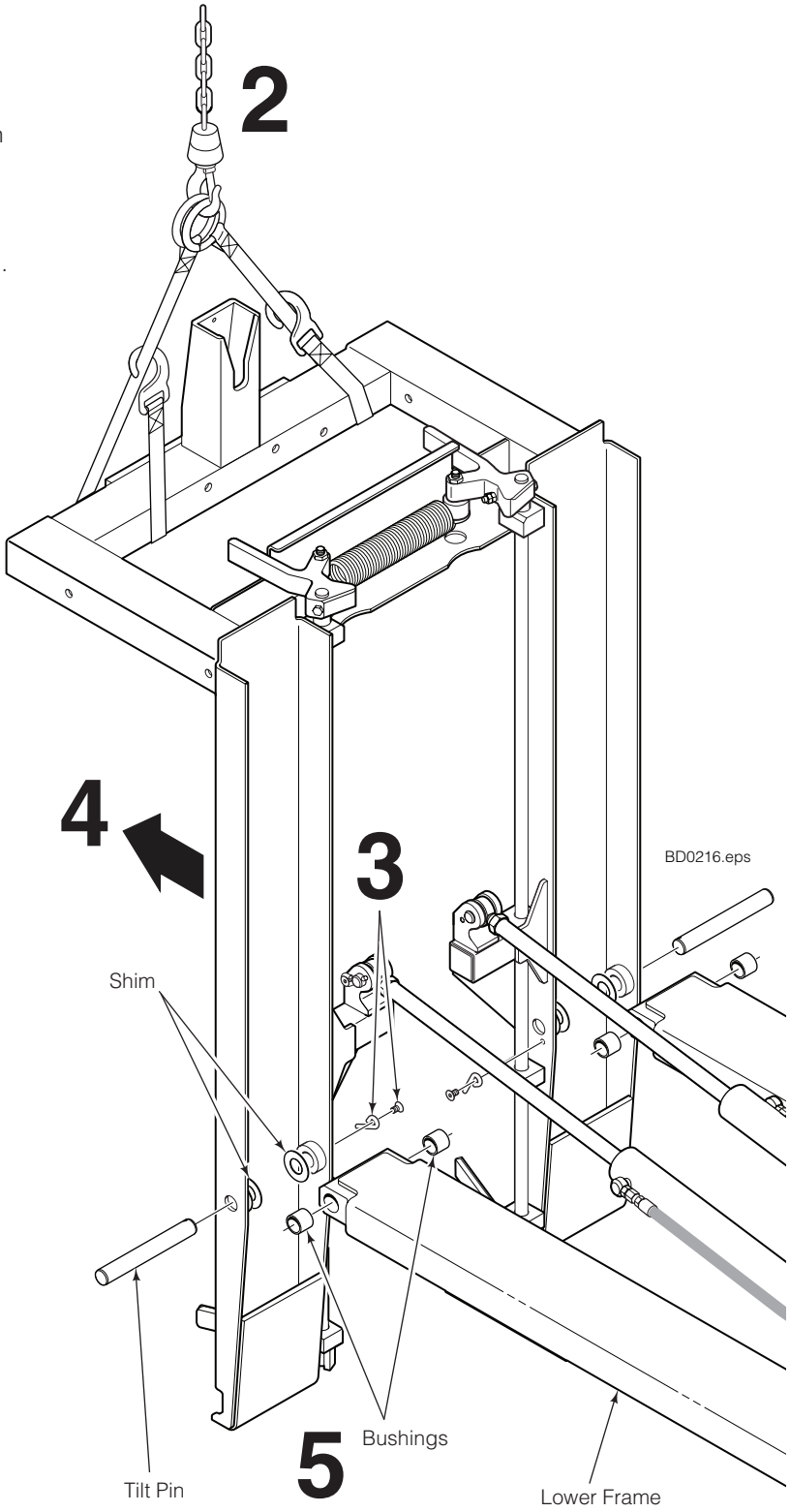
4 Carefully move the upper frame forward about 2 in. (50.8 mm) to provide access to the bushings in the lower frame.

5 Remove tilt pin bushings from the lower frame.

6 For reassembly, reverse the above procedures with the following exceptions:

- Install new bushings in the lower frame.

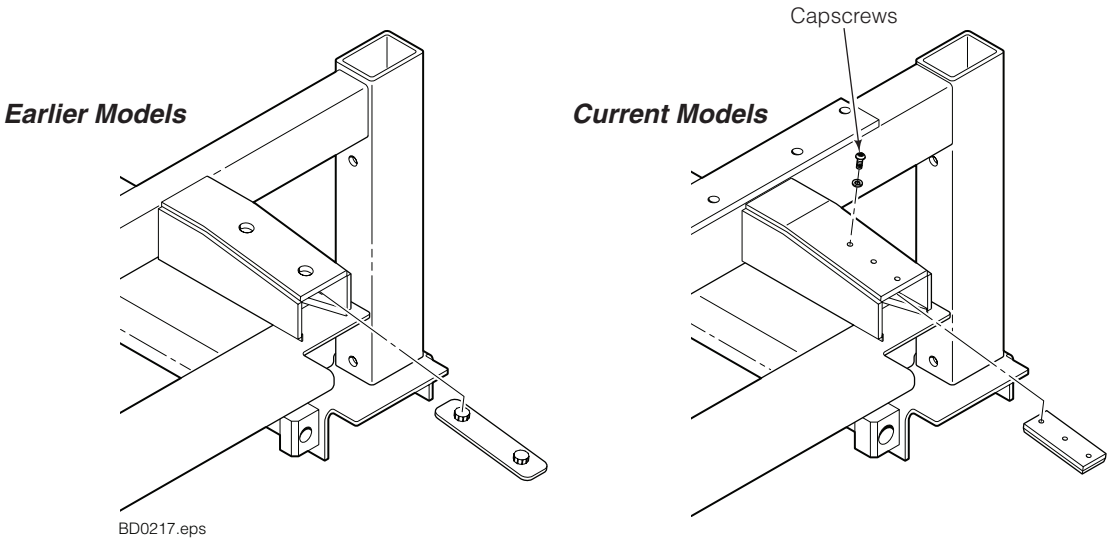
  CAUTION: Bushings may be damaged if installed without a proper bushing driver.
- Install new tilt pins.
- Shim as required to align with upper frame.



4.2-5 Lift Pad Service

1. Tilt upper frame forward to gain access to pad.
2. **Earlier Models -** Remove tilt pad by prying from the tilt cylinder stop flange. If the pad is worn to less than 3/32 in. (2.5 mm) thickness, replace necessary.

   Current Models - Remove buttonhead capscrews and washers from the top of the stop flange. Replace pad as necessary.

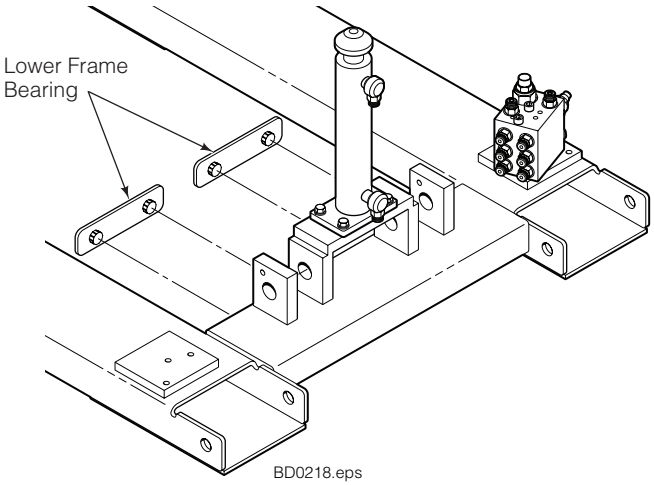


4.3 Lower Frame

Service to the lower frame components can be performed while the attachment is mounted on the truck.

4.3-1 Lower Frame Bearing Service (if equipped)

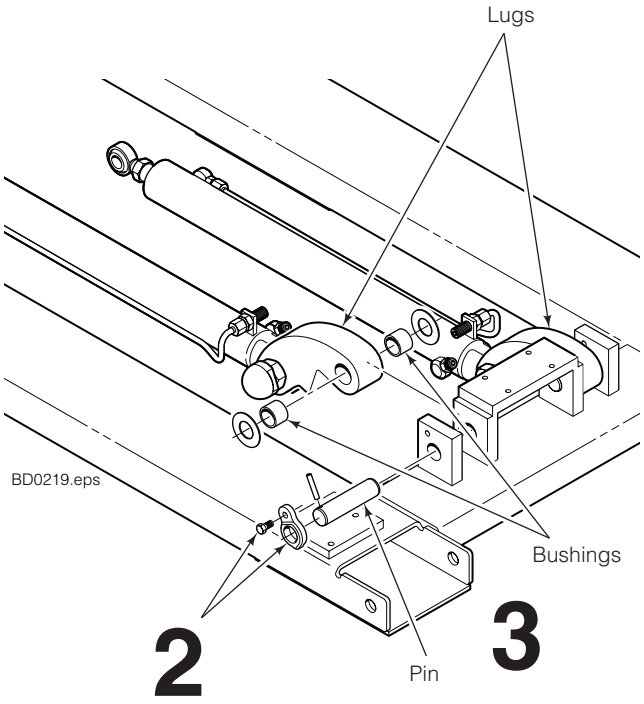
1. Raise attachment and tilt upper frame to 135° position.
2. If the bearing is worn to less than 3/32 in. (2.5 mm) thickness. Replace as necessary. Remove lower frame bearing by prying them from the face of the attachment.



4.3-3 Lug Bushing Service (if equipped)

1. Raise the attachment and tilt upper frame to 135° position.
2. Remove capscrew and retainer from the lug pin. For reassembly, tighten capscrew to 9.5 ft.-lbs. (13 Nm).
3. Drive out the pin and bushings. Note the location of the shims for reassembly.
4. For reassembly, reverse the above procedures with the following exceptions:
   - Install new bushings in the lug.

     CAUTION: Bushings may be damaged if installed without a proper bushing driver.
   - Install new pivot pins.
   - Shim lugs, as required, to align with upper frame.



4.4 Valve

4.4-1 Removal and Installation

1 Fully collapse upper frame.

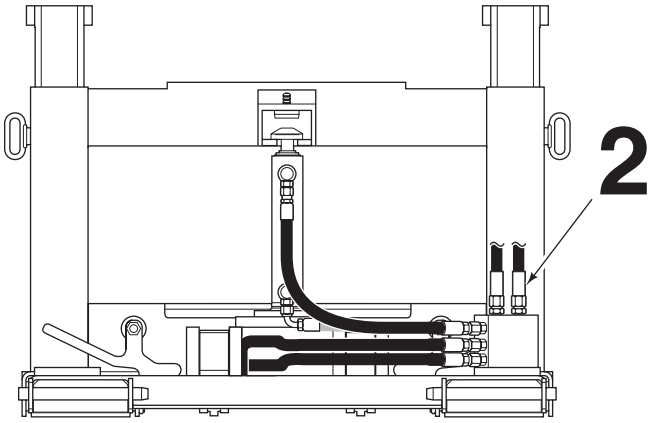
> **WARNING**: Before removing any hoses, relieve pressure in the hydraulic system. With the truck off, open the truck auxiliary control valve(s) several times in both directions.

2 Disconnect, plug and tag the hydraulic hoses to the valve.

3 Remove the two capscrews fastening the valve to the lower frame and remove the valve. For reassembly, tighten the capscrews to 9.5 ft.-lbs. (13 Nm).

4 For reassembly, reverse the above procedures with the following exceptions:

- Service the valve as described in the next section.



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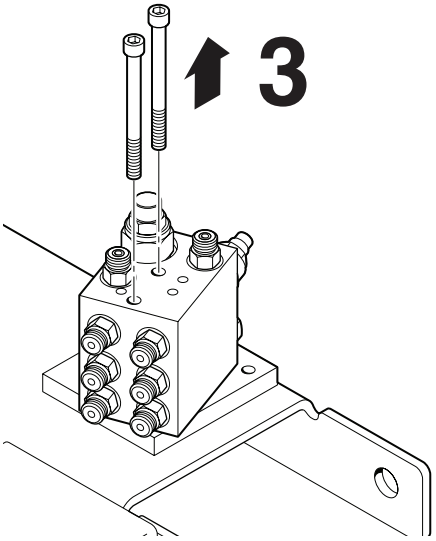

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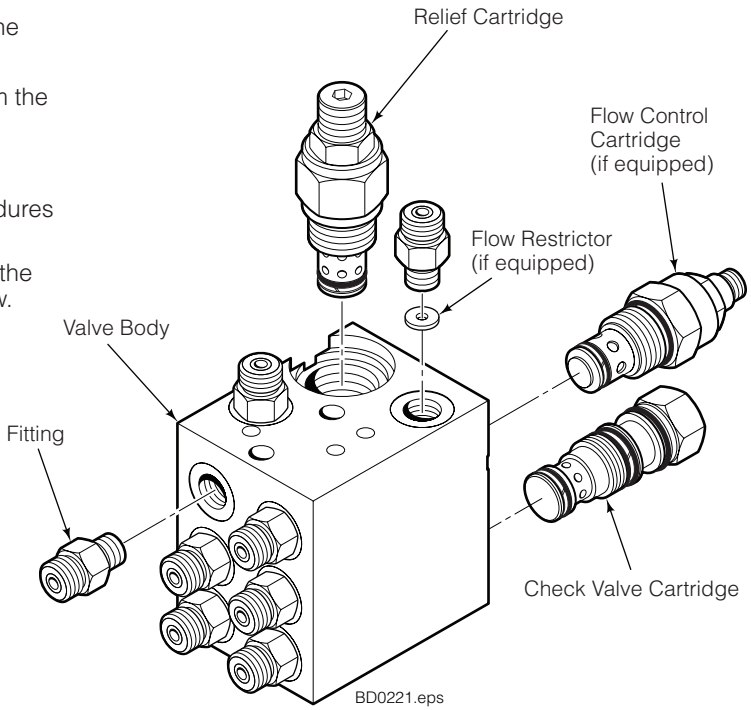
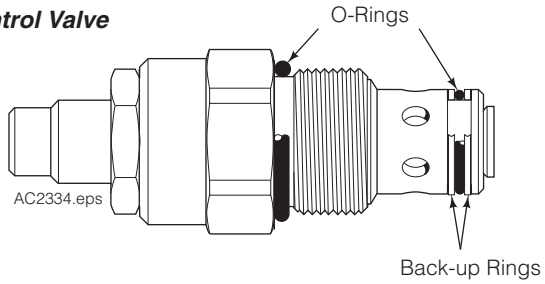
4.4-2 Valve Service

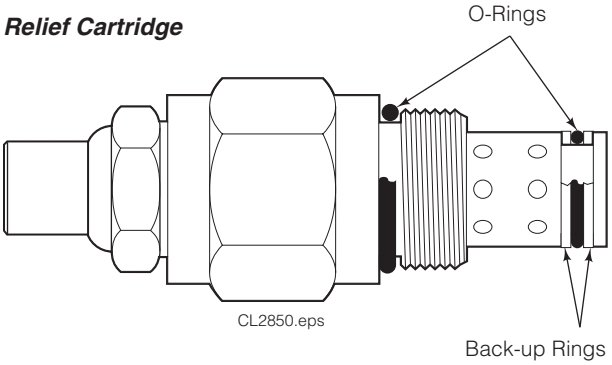
1. Remove the valve from the attachment as described in Section 4.4-1.
2. Remove the cartridges and fittings from the valve.
3. Remove the O-ring and backup rings from the cartridges and fittings.
4. Clean all parts with solvent.
5. For reassembly, reverse the above procedures with the following exceptions:
   - Replace O-rings and backup rings on the cartridges and fittings, as shown below.
   - Lubricate cartridges and fittings with petroleum jelly prior to installation.



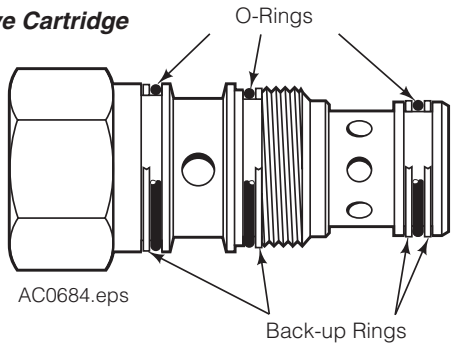
Flow Control Valve



Relief Cartridge



Check Valve Cartridge



4.5 Tilt Cylinders

4.5-1 Cylinder Removal

NOTE: The cylinders can be serviced with the attachment remaining on the truck. Service one cylinder at a time.

1 Unscrew tilt adjuster stops all the way out.

2 Tip bin dumper outer frame until the frame comes to a stop. If available, secure outer frame with an overhead hoist. If no hoist, service one cylinder at a time.

3 Remove the spring and hardware from the rear fipper with a 19 mm socket. Insert socket through holes located on the guard plate.

4 Loosen the stop assembly jam nuts for each cylinder as follows:

A With two 1.5 in. open end wrenches, loosen jam nuts and screw toward end of threaded rod.

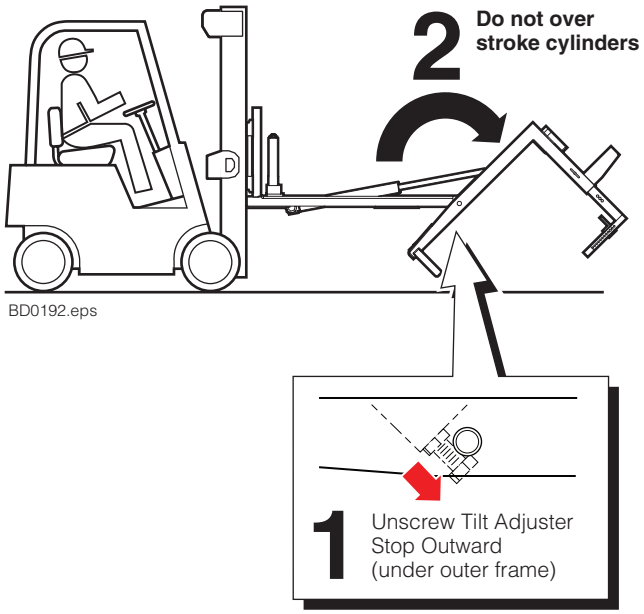
B Slide the stop assembly outward, leaving room for the spherical nut to be removed.

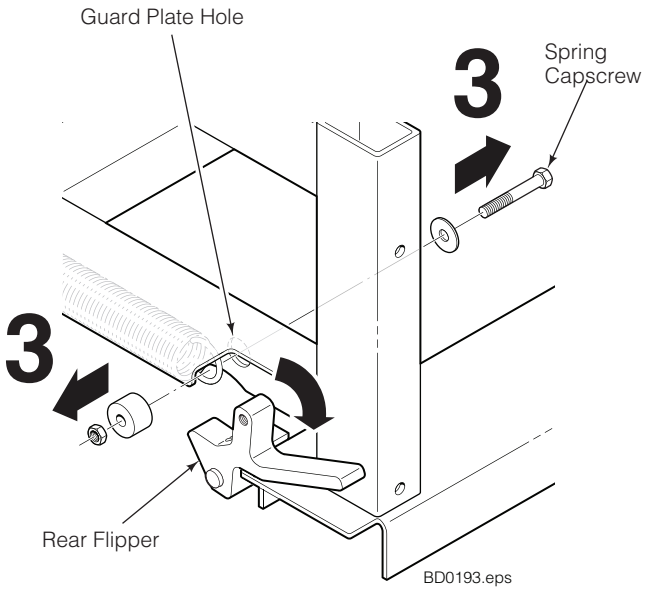
NOTE: Verify there is clearance for a wrench on the spherical nut and tube assembly on the cylinder.

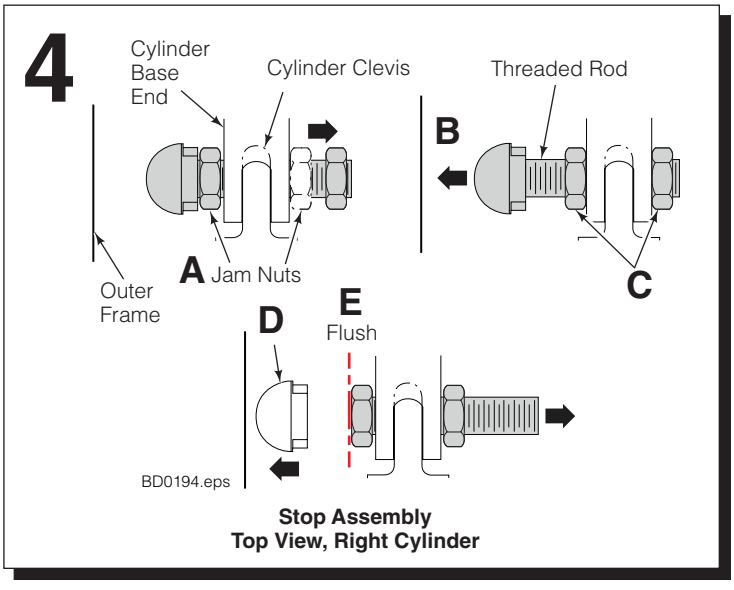
C Retighten jam nuts against cylinder clevis until the threaded rod doesn't turn when the spherical nut is loosened.

D Remove the spherical nut.

E Loosen jam nuts without removing threaded rod. Position outside jam nut flush with threaded rod end.







Stop Assembly
Top View, Right Cylinder

4.5-1 Cylinder Removal (continued)

WARNING: Before removing any hoses, relieve pressure in the hydraulic system. With the truck off, open the truck auxiliary control valve(s) several times in both directions.

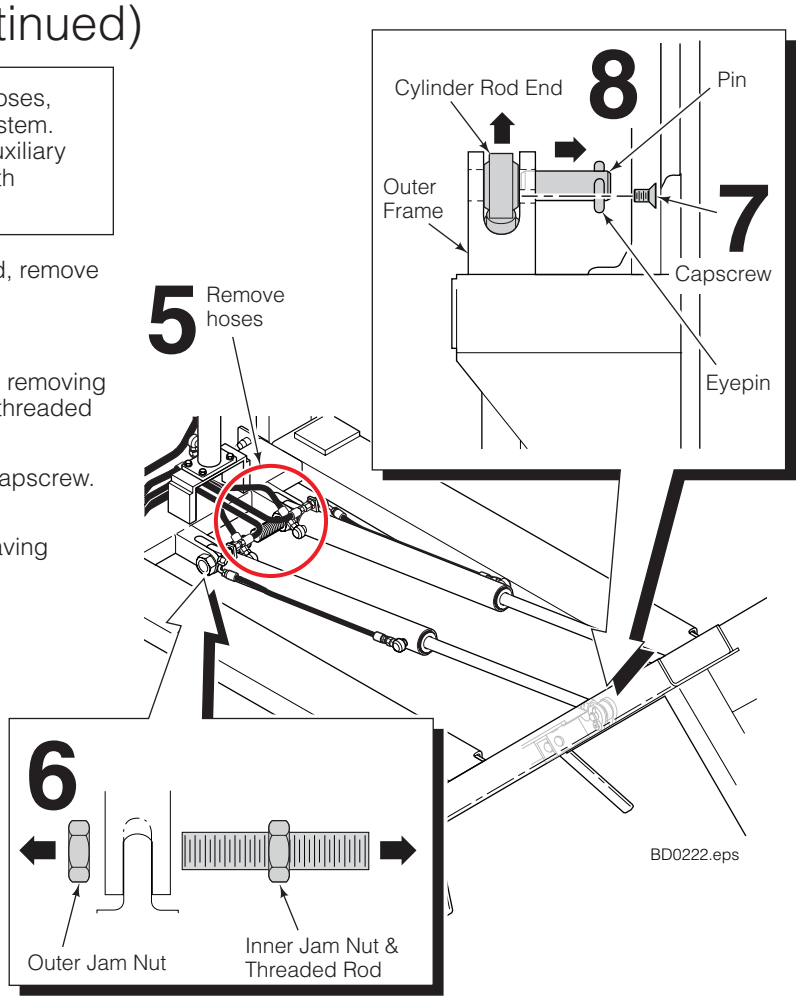
CAUTION: If an overhead hoist is not being used, remove and upgrade one cylinder at a time.

5 Remove hoses from the cylinders.

6 Remove stop assembly from each cylinder by removing jam nuts from the threaded rod. Remove the threaded rod. Remove the sleeve.

7 From rod end of cylinders, remove flat head capscrew. Keep eyepin retainer and pin in place.

8 Remove cylinders by tapping pin outward, leaving eyepin retainer in pin.

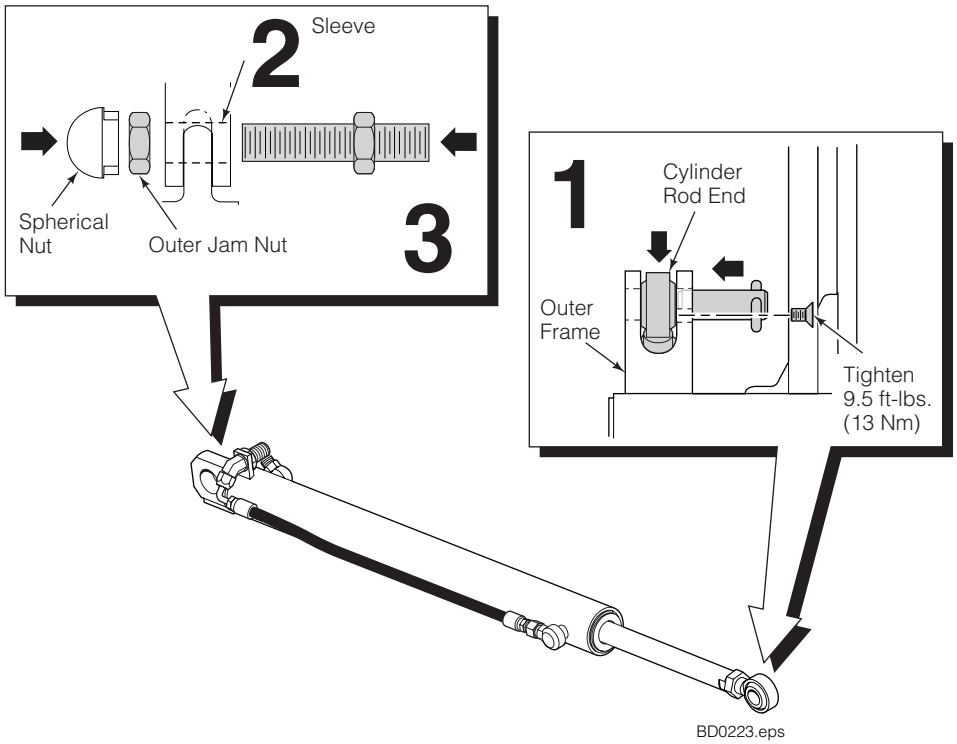


For Installation:

1 Reinstall rod end of cylinder to outer frame. Tighten eye pin retainer capscrew to 9.5 ft.-lbs. (13 Nm).

2 While reinstalling the base end of the cylinder, insert the sleeve into the inner frame clevis and through the cylinder base end.

3 Slide threaded rod into the sleeve. Thread on the jam nuts. Thread spherical nut on the outer side of the thread rod and tighten. Turn the outer nut until it touches against the spherical nut. Slide the threaded rod to the face of the outer frame clevis. Hand tighten inner jam nut against the clevis.

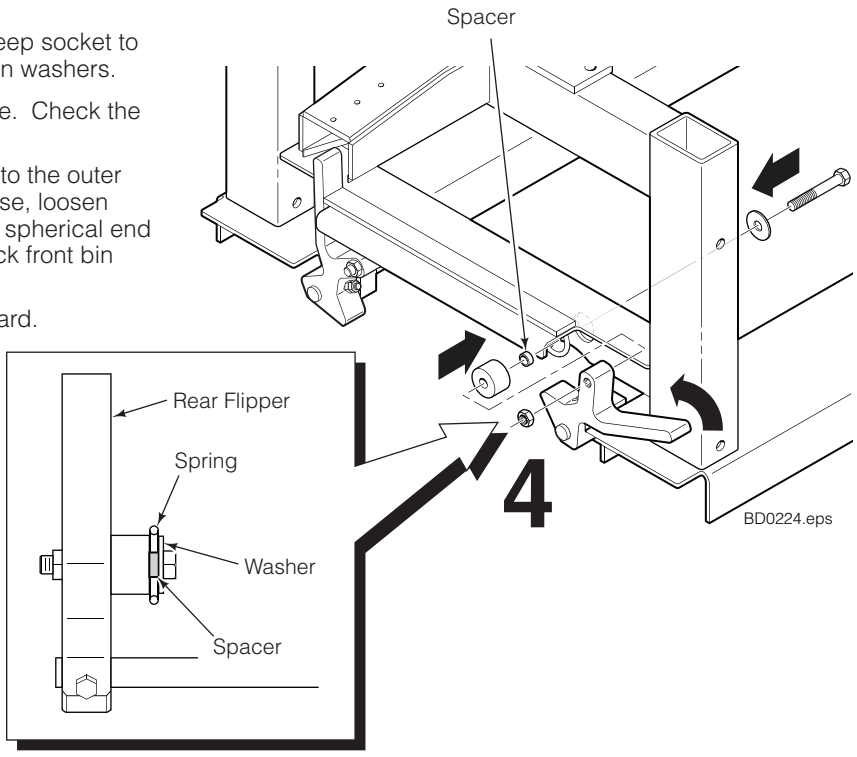


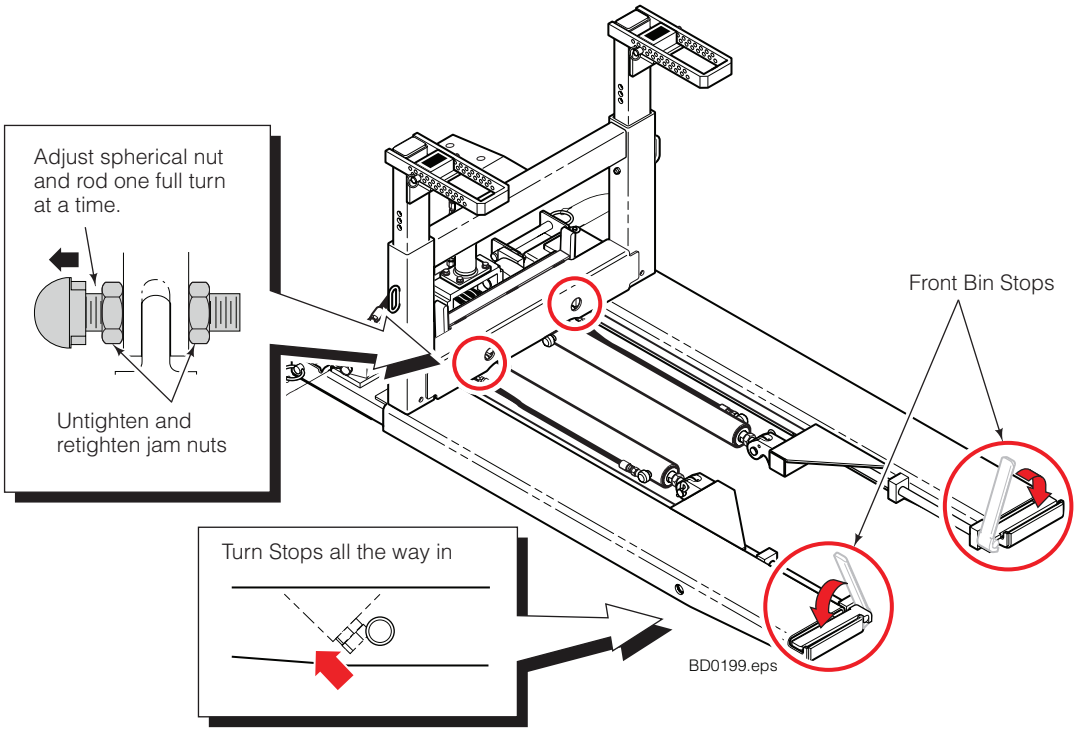
Installation (Continued)

4 Reinstall spring and hardware using a deep socket to install capscrews. Install spacer between washers.

5 Collapse outer frame onto the inner frame. Check the following:

- Front bin stops collapse all the way into the outer frame. If front bin stops do not collapse, loosen jam nuts of stop assembly and adjust spherical end outward. Retighten jam nuts. Recheck front bin stops.
- Turn tilt adjuster stops all the way inward.




Adjust spherical nut and rod one full turn at a time.
Untighten and retighten jam nuts
Front Bin Stops
Turn Stops all the way in
BD0199.eps

4.5-2 Cylinder Disassembly

1 Remove hose from cylinder.

2 Clamp the cylinder at its base end in a soft-jawed vise. Clamp lightly on the base end only.

3 Adjust the cylinder rod in the partially extended position. Remove the spiral snap ring from the retainer, as shown.

4 Tap the retainer into the shell approximately 2 in. (50 mm). Remove the retaining ring by prying one end up and working the ring out of the groove.

Service Tool Kit 674424 includes two double-ended brass tools that make seal and ring removal easy. The tools won't damage the cylinder components with dents or scratches.

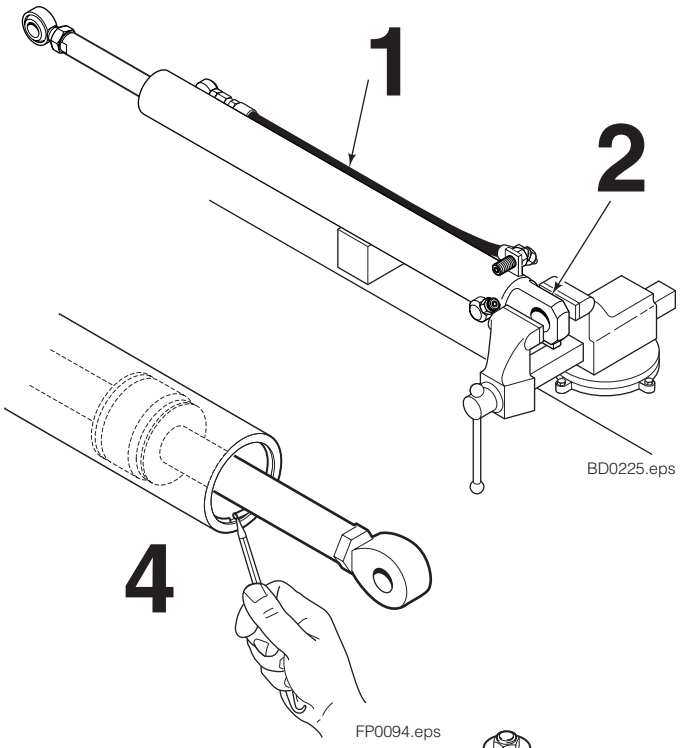
CAUTION: Do not scratch the cylinder bore.

5 Remove the rod assembly from the cylinder. Refer to the illustration below.

6 Clamp the rod assembly in a soft-jawed vise or between two blocks of wood. Never clamp directly on the rod sealing surface. Remove the nut fastening the piston to the rod. Remove the piston and retainer.

7 Place the piston or retainer in the vise to remove the seals. Pry the seals up with a brass tool. Cut the seals to remove.

CAUTION: Do not scratch the seal grooves.



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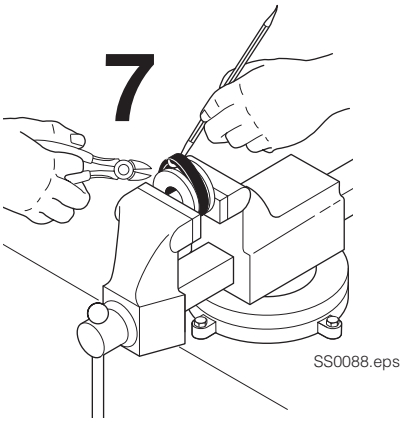

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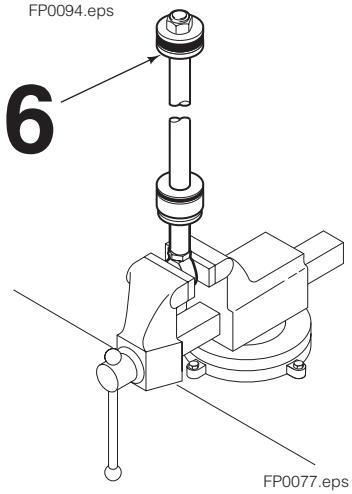

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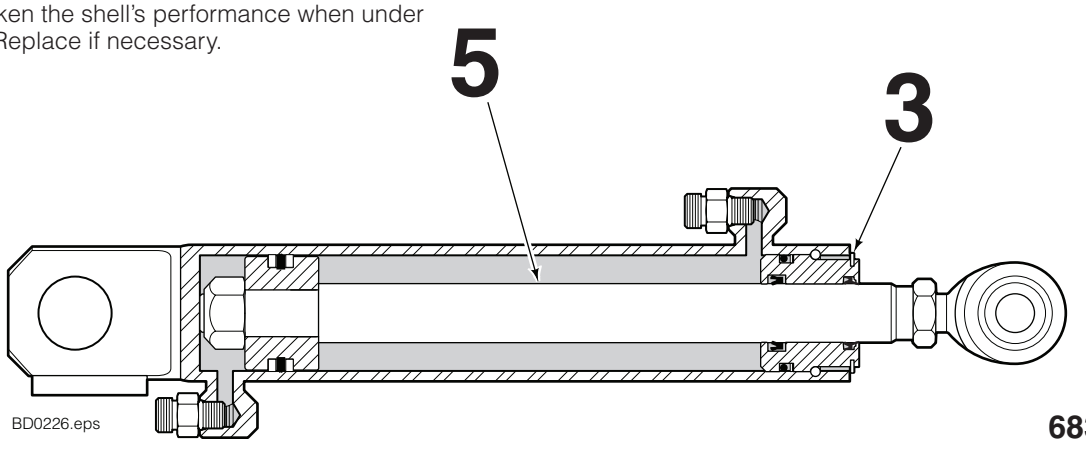
4.5-3 Cylinder Inspection

- Inspect all components for nicks or burrs. Minor nicks or burrs can be removed with 400-grit emery cloth.

  NOTE: Minor nicks are those that will not bypass oil under pressure. If nicks cannot be removed with emery cloth, replace the part.

- Inspect the outside of the shell for deformities that could weaken the shell's performance when under pressure. Replace if necessary.



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4.5-4 Cylinder Reassembly

1 Polish the piston and retainer chamfer angle with emery cloth. This allows the seals to slide over the chamfer easier.

2 Wash all components with cleaning solvent. Lubricate all new seals and rings with petroleum jelly.

3 Note the direction of the U-cup seals. If the seals are installed backward they will not work properly. For proper seal placement, refer to the illustration below.

4 Install the new seals on the piston and retainer. Hook one side of the seal in the groove and push it over the piston or retainer.

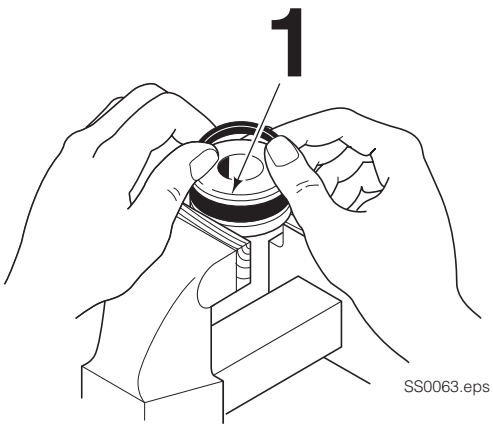
5 Install the retainer and piston on the rod. Tighten the piston retaining nut to 47 ft.-lbs. (64 Nm).

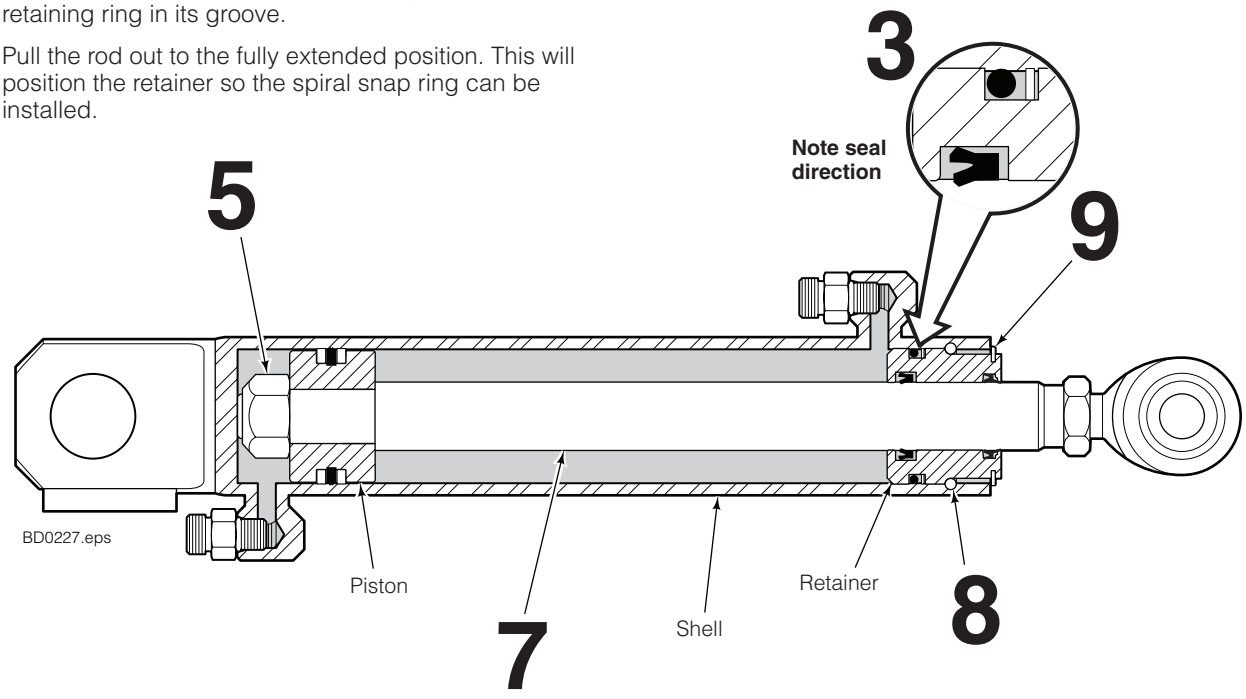
6 Apply a thick film of petroleum jelly to the inside of the cylinder shell, piston seals and retainer.

7 Insert the rod assembly into the cylinder shell. If resistance is encountered, tap the rod end with a rubber mallet.

8 Tap the retainer into the shell far enough to install the retaining ring in its groove.

9 Pull the rod out to the fully extended position. This will position the retainer so the spiral snap ring can be installed.





4.6 Lift Cylinder

4.6-1 Cylinder Removal

NOTE: The lift cylinder can be serviced with the attachment remaining on the truck.

1 Raise the attachment and tilt upper frame to 135° position.

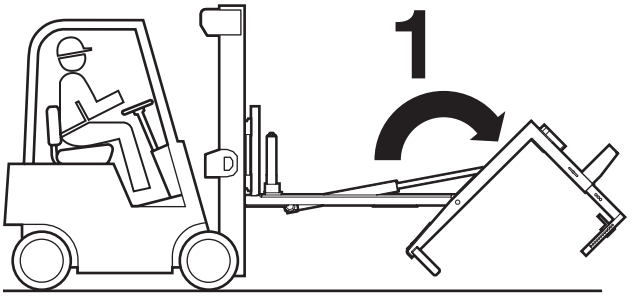
2 Remove hoses from lift cylinder.

> **WARNING**: Before removing any hoses, relieve pressure in the hydraulic system. With the truck off, open the truck auxiliary control valve(s) several times in both directions.

3 Remove capscrews from base of the cylinder.

4 For reassembly, reverse the above procedures, except as follows:

- Operate the attachment through several full cycles. Check for leaks at all fittings.



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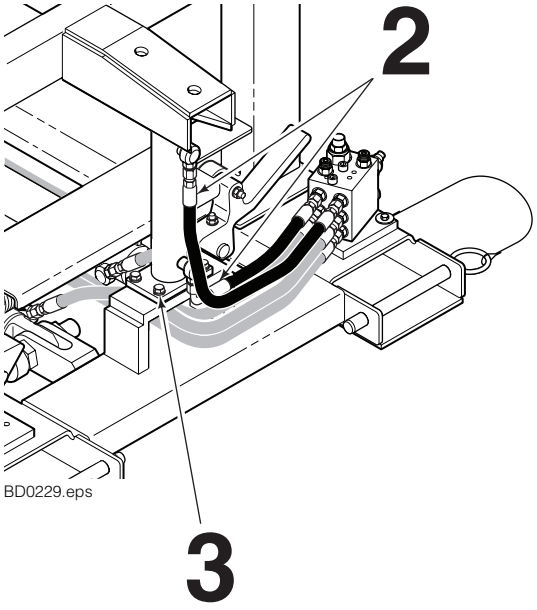

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4.6-2 Cylinder Disassembly

1 Clamp the cylinder at its base end in a soft-jawed vise. Clamp lightly on the base end only.

2 Adjust the cylinder rod in the partially extended position. Remove the spiral snap ring from the retainer.

3 Tap the retainer into the shell approximately 2 in. (50 mm). Remove the retaining ring by prying one end up and working the ring out of the groove.

Service Tool Kit 674424 includes two double-ended brass tools that make seal and ring removal easy. The tools won't damage the cylinder components with dents or scratches.

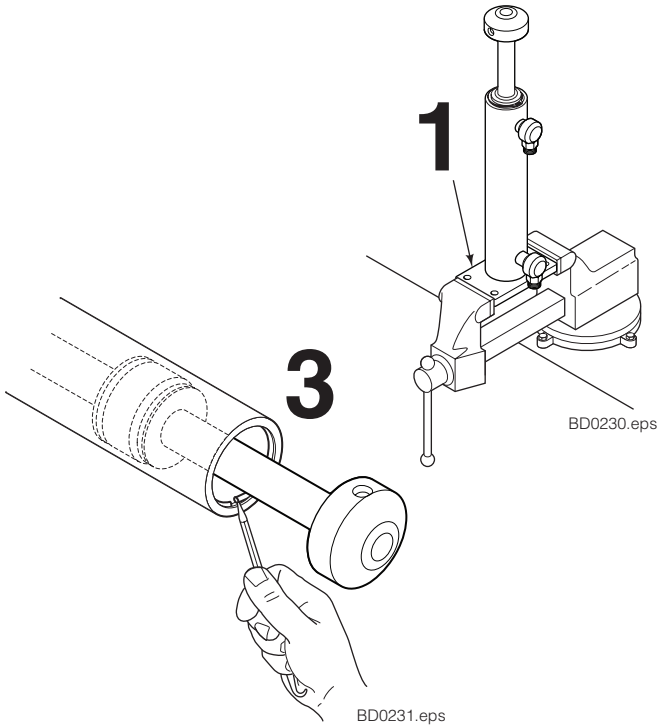
CAUTION: Do not scratch the cylinder bore.

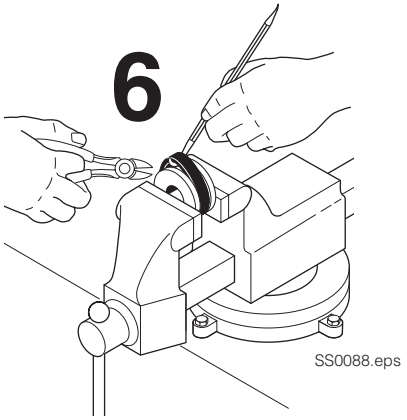
4 Remove the rod assembly from the cylinder. Refer to the illustration below.

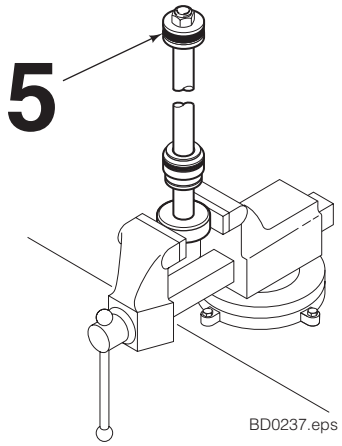
5 Clamp the rod assembly in a soft-jawed vise or between two blocks of wood. Never clamp directly on the rod sealing surface. Remove the nut fastening the piston to the rod. Remove the piston and retainer.

6 Place the piston or retainer in the vise to remove the seals. Pry the seals up with a brass tool. Cut the seals to remove.

CAUTION: Do not scratch the seal grooves.





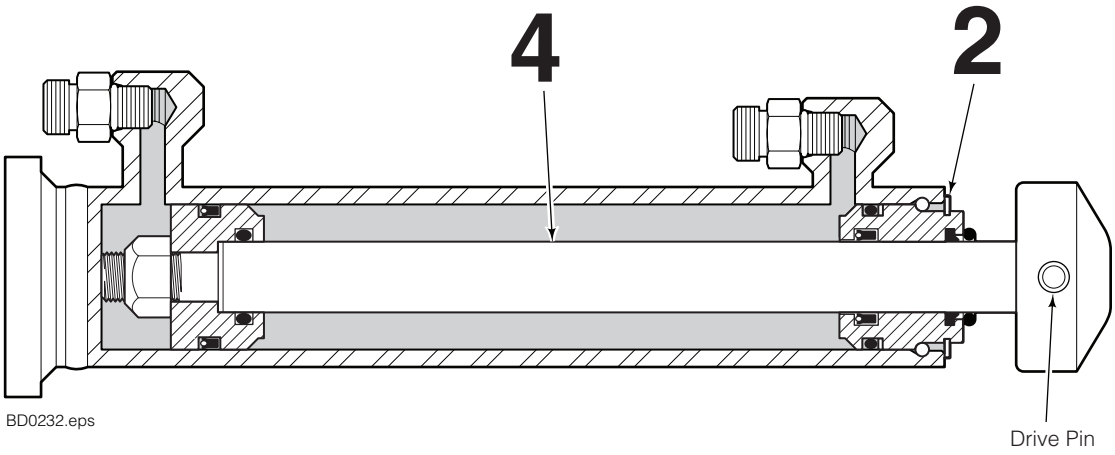


4.6-3 Cylinder Inspection

- Inspect all components for nicks or burrs. Minor nicks or burrs can be removed with 400-grit emery cloth.

  NOTE: Minor nicks are those that will not bypass oil under pressure. If nicks cannot be removed with emery cloth, replace the part.

- Inspect the outside of the shell for deformities that could weaken the shell's performance when under pressure. Replace if necessary.



4.6-4 Cylinder Reassembly

1 Polish the piston and retainer chamfer angle with emery cloth. This allows the seals to slide over the chamfer easier.

2 Wash all components with cleaning solvent. Lubricate all new seals and rings with petroleum jelly.

3 Note the direction of the U-cup seals. If the seals are installed backward they will not work properly. For proper seal placement, see the illustration below.

4 Install the new seals on the piston and retainer. Hook one side of the seal in the groove and push it over the piston or retainer.

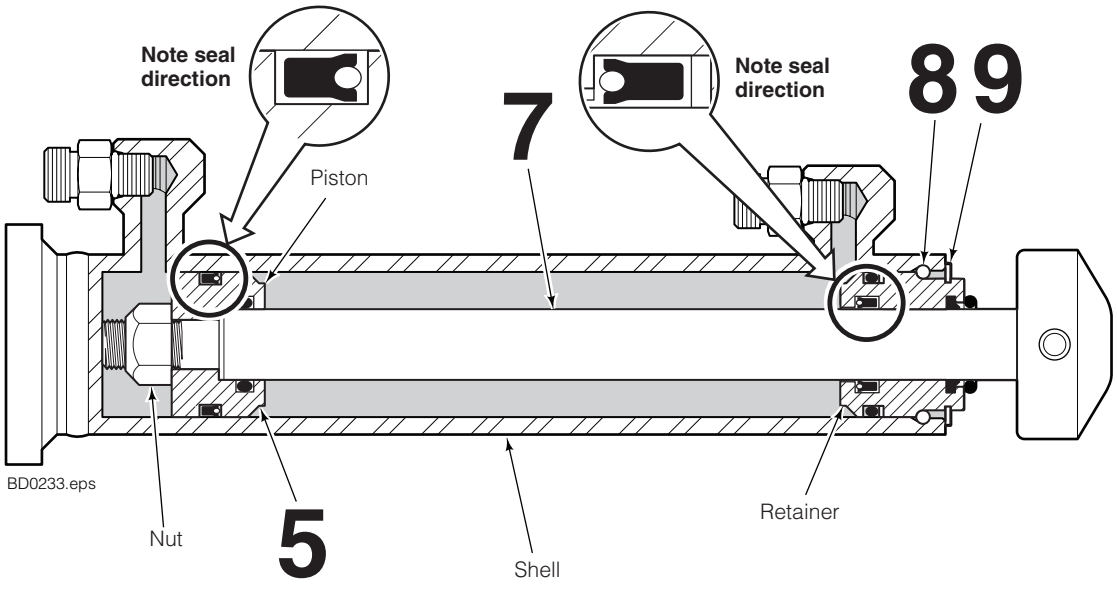
5 Install the retainer and piston on the rod and tighten the piston retaining nut to 47 ft.-lbs. (64 Nm).

6 Apply a thick film of petroleum jelly to the inside of the cylinder shell, piston seals and retainer.

7 Insert the rod assembly into the cylinder shell. If resistance is encountered, tap the rod end with a rubber mallet.

8 Tap the retainer into the shell far enough to install the retaining ring in its groove.

9 Pull the rod out to the fully extended position. This will position the retainer so the spiral snap ring can be installed.



5.1 Specifications

5.1-1 Hydraulics

Truck Relief Setting

2000 psi (140 bar) Recommended
2300 psi (160 bar) Maximum

Truck Flow Volume ①

	Min. ②	Recommended	Max. ③
10A	5 GPM (19 L/min.)	7 GPM (26 L/min.)	10 GPM (38 L/min.)

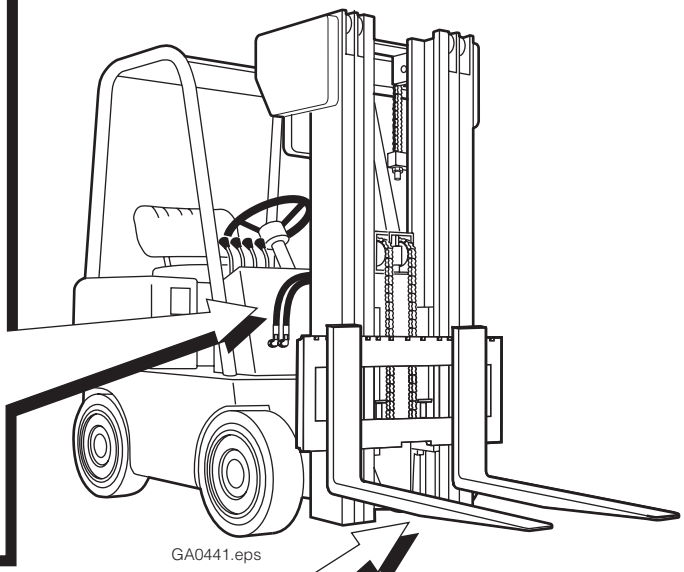
① Cascade Bin Dumpers are compatible with SAE 10W petroleum base hydraulic fluid meeting Mil. Spec. MIL-0-5606 or MIL-0-2104B. Use of synthetic or aqueous base hydraulic fluid is not recommended. If fire resistant hydraulic fluid is required, special seals must be used. Contact Cascade.

② Flow less than recommended will result in slower than normal dumping speed.

③ Flow greater than maximum can result in excessive heating, reduced system performance and short hydraulic system life.

Hoses and Fittings

All supply hoses and fittings should be at least No. 6 with 9/32 in. (7 mm) minimum ID.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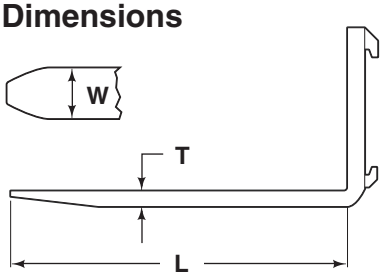
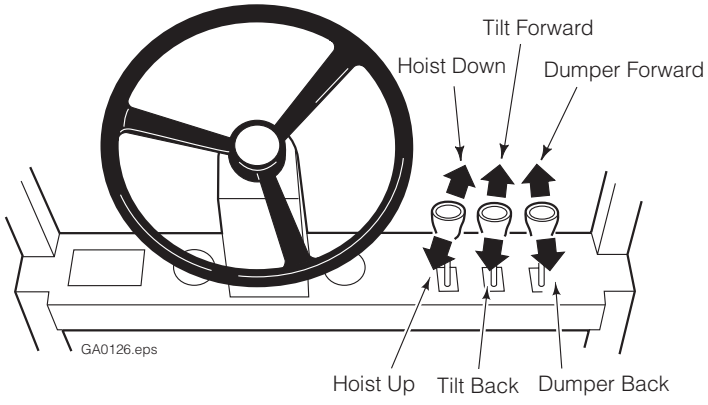
Maximum Fork Dimensions

Width (W) – 5.7 in. (145 mm)
Thickness (T) – 2.0 in. (50 mm)
Length (L) – 43.3 in. (1100 mm)



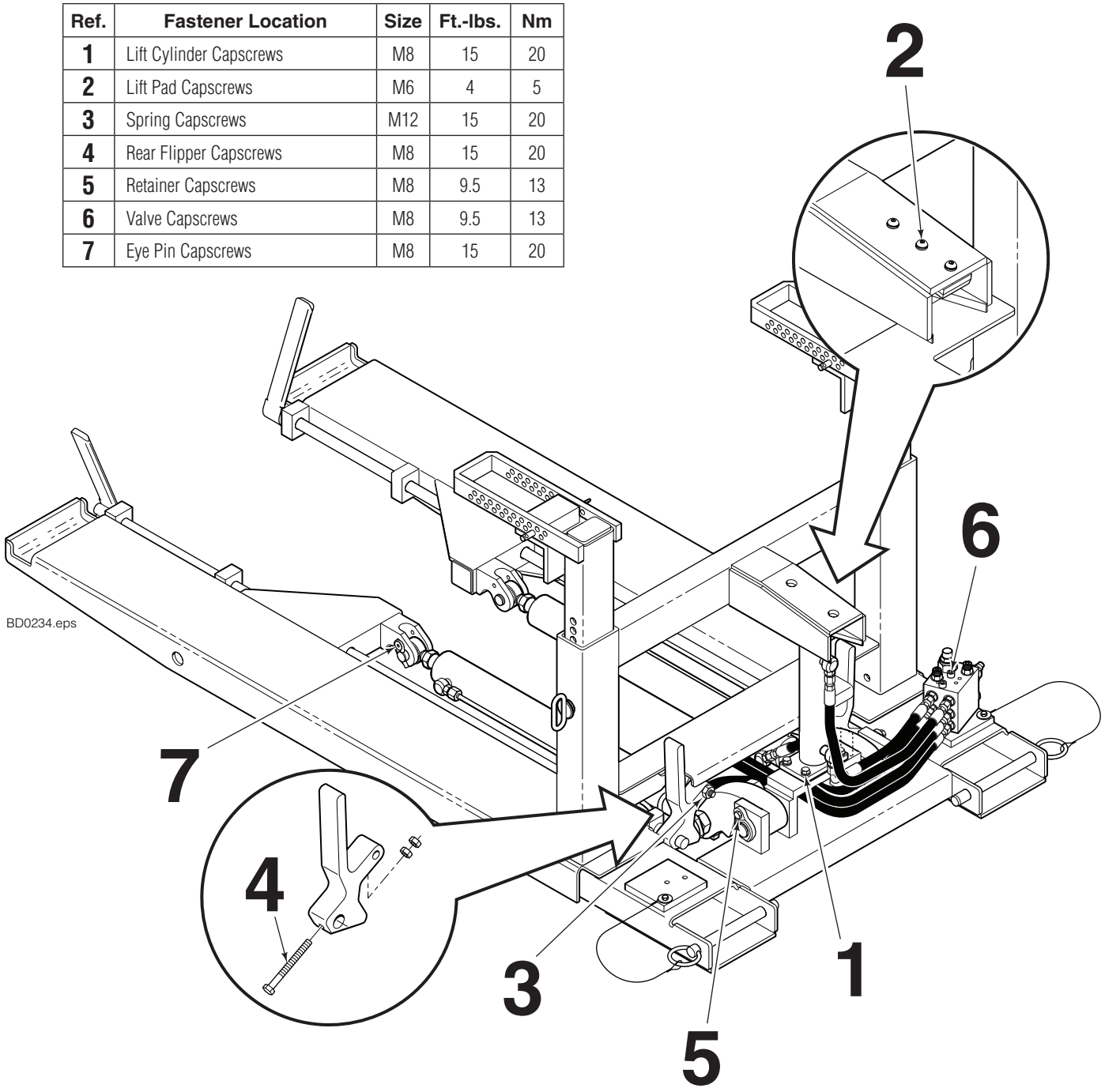
5.1-2 Auxiliary Valve Functions



5.1-4 Torque Values

Fastener torque values for the 10A Bin Dumper are shown in the table below in both US and metric units. All torque values are also called out in each service section throughout the manual.

Ref.	Fastener Location	Size	Ft.-lbs.	Nm
1	Lift Cylinder Capscrews	M8	15	20
2	Lift Pad Capscrews	M6	4	5
3	Spring Capscrews	M12	15	20
4	Rear Flipper Capscrews	M8	15	20
5	Retainer Capscrews	M8	9.5	13
6	Valve Capscrews	M8	9.5	13
7	Eye Pin Capscrews	M8	15	20



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Call your nearest Cascade Service Department.
Visit us online at www.cascorp.com

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